vRTK GNSS

RTK GNSS system with IMU sensor and visual positioning technology

Equipped with professional **dual cameras**, vRTK is Hi-Target's first lightweight and innovative **visual RTK** receiver product, which not only enables non-contact image surveying, breaking through the objective constraints of previous work, but also improves the speed of stakeout with the function of **Live View Stakeout.** It greatly improves the work efficiency of engineering users.vRTK.
Dual Cameras for Image Survey and Live View Stakeout. **Non-contact measurement** greatly improves the usable range of GNSS and efficient safe operation.

NOVATEST
Engineering Solutions

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Strong Signal and High-quality Data

New generation GNSS SOC chip with 1408 channels, supports new frequency points B1C, B2a, and B2b RTK decoding for Beidou-3 Satellites. -Introduction of multi-frequency anti-jamming technology and multi-step adaptive filtering technology to ensure strong signals, high-quality data, fast fix, and high accuracy.

Abundant Industry Data Results

Abundant types of data results meet the needs of different industry applications. Compatible with the mainstream modelling software to attain point cloud and 3D modelling in one step.

Technical features:

vRTK main parameters:

- Inclination 8mm + 0.7 mm/°
- Accuracy of tilt detection
- Channels: 1408
- Satellite tracking: BDS/GPS/GLONASS/GALILEO/QZSS/IRNSS/SBAS
- Accuracy of image staking out: 2 cm
- Image tracking accuracy: 2cm ~ 4cm
- Data Storage: Built-in 8GB ROM

Perfomance specification:

- Satellite Signals Tracked Simultaneously
  - Channel: 1408/800+ (optional)
  - GPS: L1C/A, L1C, L2P(Y), L2C, L5
  - BeiDou: B1I, B2I, B3I, B1C, B2a, B2b*
  - GLONASS: L1, L2, L3
  - Galileo: E1, E5A, E5, AltBOC, E5B, E6
  - IRNSS: L5
  - SBAS: L1C/A, L5 (QZSS, WAAS, MSAS, GAGAN)
  - QZSS: L1, L2, L5, L6*

Positioning performance (2):

- High -Precision Static
  - Horizontal: 2.5 mm + 0.1 ppm RMS
  - Vertical: 3.5 mm + 0.4 ppm RMS
- Static and Fast Static:
  - Horizontal: 2.5 mm + 0.5 ppm RMS
  - Vertical: 5 mm + 0.5 ppm RMS
- Post Processing Kinematic (PPK / Stop & Go)
  - Horizontal: 8 mm + 1 ppm RMS
  - Vertical: 15 mm + 1 ppm RMS
  - Initialization time: Typically 10 min for base and 5 min for rover
  - Initialization reliability: Typically > 99.9%
- Code Differential GNSS Positioning
  - Horizontal: 25 cm + 1 ppm RMS
  - Vertical: 50 cm + 1 ppm RMS
  - SBAS: 0.5 m
- Real Time Kinematic (RTK) Single Baseline
  - Horizontal: 8 mm + 1 ppm RMS
  - Vertical: 15 mm + 1 ppm RMS

- Network RTK (VRS, FKP, MAC)
  · Horizontal:8 mm + 0.5 ppm RMS
  · Vertical: 15 mm + 0.5 ppm RMS
  · Initialization time: Typically 2-10 s
  · Initialization reliability: Typically > 99.9%
  · Provides RTK measurements even during differential signal interruptions
- Hi-Fix (5)
  · Horizontal: RTK + 10 mm / minute RMS
  · Vertical: RTK + 20 mm / minute RMS
- Time to first Fix
  · Cold start: < 45 s
  · Hot start: < 30 s
  · Signal re-acquisition: < 2 s
- Image Accuracy
  · Stakeout: Typically 2 cm
  · Image Measurement: 2 cm ~ 4 cm
- Tilt Survey Performance (3)
  · Additional horizontal pole-tilt uncertainty typically less than 8 mm + 0.7 mm / °tilt (2.5 cm accuracy in the inclination of 60°)

Hardware:

- Physical
  · Dimensions (W x H): 130 mm x 79 mm
  · Weight: lighter than 0.97 Kg within internal battery
  · Operation temperature: -40°C ~ +75°C
  · Storage temperature: -55°C ~ +85°C
  · Temperature control: Auto-adjust the working power to maintain the temperature
  · Hymidity: 100%, non-condensing
  · Water/dustproof: IP68 rustproof, protected from temporary immersion to depth of 1.0 m
  · Shock and vibration: MIL-STD-810G, 514.6
  · Anti-salt spray: MIL-STD-810G, 509.4, 96h
  · Free fall: MIL-STD-810G, 516.6, designed to survive a 2 m natural fall onto concrete
- Charging
  Charging: using standard smartphone chargers or external power banks (Support 5V 2.8A Type-C USB external charging)
- Control Panel
  · Physical button: 1
  · LED Lights: Satellite lights, signal lights, power lights

- Camera
  · Pixel: 2 MP & 5 MP
  · Support real scene stakeout, image measurement, working distance 2 ~ 15 m
- Internal Battery (4)
  · 7.2V, 6900 mAh Built-in lithium-ion battery
  · RTK rover (UHF/Cellular) for 15 hours
  · Power indicator embedded
  · Quick charge within 3.5 hours
- I/O Interface
  · Bluetooth 4.0/2.1 + EDR, 2.4 GHz. USB type C interface; SMA interface;
  · Nano SIM card slot
  · Near Field Communication (NFC)

Communication

- Network Communication
  Full band support for cellular mobile network (LTE, WCDMA, EDGE, GPRS, GSM). 2.4 GHz Wi-Fi, supports the standard protocol 802.11 b/g/n. Network RTK (in CORS) range is 20-50 Km.
- Internal UHF Transceiver Radio
  · Frequency: 410 ~ 470 MHz
  · Transmitting power: 0.5W./ 1W / 2W adjustable Hi-Target Advanced Radio
  · Supports protocols: HI-TARGET, TRIMTALK450S, TRIMMARK III, SATEL-3AS, TRANSEOT, etc.
  · Working Range: Typically 3~5 Km, optimal 5~8 Km
  · Channels: 116

System configuration

- System
  · Data storage: Circulating 8GB Internal storage Record GNS and RINEX format simultaneously
- Data Formats
  · 1 Hz positioning output, up to 20 Hz. RTCM2.X, RTCM3.X.
  · Navigation outputs ASCII: NMEA-0183

(1) BDS B2b, GALILEO E6, QZSS L6, IRNSS L5 possono essere forniti tramite l'aggiornamento del firmware. BDS B2b è opzionale per 1408 canali.
(2) L'accuratezza, la precisione, l'affidabilità e il tempo di inizializzazione della misurazione dipendono da vari fattori, tra cui l'angolo di inclinazione, il numero di satelliti, la distribuzione geometrica, il tempo di osservazione, le condizioni atmosferiche e la convalida multi-percorso, ecc. I dati sono derivati in condizioni normali.
(3) Operazioni irregolari come rotazioni rapide e vibrazioni ad alta intensità possono influire sulla precisione della navigazione inerziale.
(4) Il tempo di funzionamento della batteria è correlato all'ambiente operativo, alla temperatura operativa e alla durata della batteria
(5) Le precisioni dipendono dalla disponibilità dei satelliti GNSS. Il posizionamento Hi-Fix termina dopo 5 minuti senza dati differenziali. Hi-Fix non è disponibile in tutte le regioni, verificare con il proprio rappresentante di vendita locale per ulteriori informazioni.

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